SNMTS
Advancing Molecular Imaging and Therapy

Scope of Practice for the Nuclear Medicine Technologist 2007
(Revised September 2008)

Presidential Task Force, SNM Technologist Section

An SNM *Technologist Section* (SNMTS) Presidential Task Force established in the summer of 2006 developed the following revised *SNMTS Scope of Practice* for nuclear medicine technologists. Members of the task force were: Giuliana Arcovio, BS, CNMT, RT(N); Michelle Beauvais, RPh, BCNP; David Gilmore, MS, CNMT, NCT, RT(N,R); Scott Holbrook, BS, CNMT, PET, FSNMTS; Art Hall, CNMT FSNMTS, Kent Hutchings, MS, CNMT; Lyn Mehlberg, BS, CNMT, FSNMTS; Robert Pagnanelli, BS, CNMT NCT, RT(N); David Perry, CNMT, PET, FSNMTS; George Segall, MD. The task force was chaired by Cindi Luckett-Gilbert, BHS, CNMT, PET, RT(N).

This document is not intended to modify or alter existing tort law; rather it should serve as a concise outline of nuclear medicine technology skills and responsibilities.

NUCLEAR MEDICINE TECHNOLOGY

Nuclear medicine technology is the medical specialty that utilizes sealed and unsealed radioactive materials in the diagnosis and treatment of disease. This practice also includes the utilization of pharmaceuticals and other imaging modalities to enhance the evaluation of organ and molecular function. In addition, it includes the delivery of therapeutic radiopharmaceuticals to treat a number of pathologies.

The practice of nuclear medicine technology encompasses multidisciplinary skills, which use rapidly evolving instrumentation, radiopharmaceuticals and techniques. The responsibilities of the nuclear medicine technologist include, but are not limited to, an empathetic and instructional approach to patient contact, care, and monitoring; the procurement, preparation, quality control, dispensing, dose calibration, administration, and disposal of radiopharmaceuticals; the administration of pharmaceuticals including adjunct oral and IV contrast (under the direction of an authorized user); the performance of quality control procedures; and the operation of imaging, laboratory, and computer instrumentation.

In order to perform these tasks the nuclear medicine technologist must successfully complete didactic and clinical education. Education includes, but is not limited to, anatomy, physiology, pathophysiology, ***pharmacology,*** chemistry physics, mathematics, computer applications, biomedical sciences, ethics, and radiation health and safety. Direct patient contact hours are obtained by training in a clinical education setting.

Graduates of accredited programs are eligible to sit for certification examinations offered by the *Nuclear Medicine Technology Certification Board* and/or the *American Registry of Radiologic Technologists.*

The spectrum of nuclear medicine technology skills and responsibilities varies widely across the country and often goes beyond the basic skills outlined in the technologist's initial education and certification. Practice components presented in this document provide a basis for establishing the areas of knowledge and performance for the nuclear medicine technologist. It is assumed that for all activities included in this scope of practice, the nuclear medicine technologist has received the proper education (in compliance with federal, state, and institutional requirements) supported with the proper documentation of initial and continued competency in those practices and activities. Continuing education is a necessary component in maintaining the skills required to perform all duties and tasks of the nuclear medicine technologist in this ever-evolving field of new equipment, radiopharmaceuticals, and applications.

THE SCOPE OF PRACTICE

The scope of practice in nuclear medicine technology includes, *but is not limited to,* the following areas and responsibilities:

- **Patient Care:** Requires the exercise of judgment to assess and respond to the patient's needs prior to, during, and after procedures in the nuclear medicine department, and in patient medication reconciliation.
- **Quality Control:** Requires the evaluation and maintenance of a quality control program for all instrumentation to ensure its proper performance and stability.
- **Diagnostic Procedures:** Requires the utilization of appropriate techniques, and administration of non-radiopharmaceutical agents when part of standard procedures, to ensure quality diagnostic images and/or laboratory results.
- **Radiopharmaceuticals:** Involves the procurement, preparation, quality control, dispensing, dose calculation, identification, documentation, administration, disposal, storage, and safe handling of radioactive materials used by the nuclear medicine technologist.
- **In Vivo Diagnostic Testing:** Involves the procurement, preparation, quality control, dispensing, dose calibration of radiopharmaceuticals and oral, inhalation, or intravenous administration. In some cases radiopharmaceuticals may be administered by other routes under the direct supervision of a physician.
- **In Vitro Diagnostic Testing:** Involves the procurement, preparation, quality control, dispensing, dose calibration of radiopharmaceuticals and oral, inhalation, or intravenous administration.
- **Transmission Imaging:** Involves, but is not limited to, the operation of gamma cameras with sealed sources of radioactive material for transmission imaging with single photon emission computed tomography (SPECT) or positron emission tomography (PET) and operation of cameras with x-ray tubes for transmission imaging when performed as part of SPECT/CT or PET/CT. Additionally includes diagnostic CT when performed on SPECT/CT or PET/CT cameras, including the administration of oral and intravenous contrast (requires education in CT) and the operation of scanners with x-ray tubes for the measurement of bone density.

- **Radionuclide Therapy:** Involves, but is not limited to, assisting an authorized user in the application, management, preparation, and administration of radiotherapeutic procedures and administration of nonradiopharmaceutical agents by oral and intravenous routes when part of standard procedures required for treatment.
- **Radiation Safety:** Involves, but is not limited to, educating the public while practicing techniques that will minimize radiation exposure to the patient, general public, and health care personnel, through consistent use of protective devices, shields, monitors, and other devices consistent with ALARA (as low as reasonably achievable), as well as decontaminating spills and other inappropriate releases of radiation.

I. Patient Care

A. A nuclear medicine technologist provides patient care, including but not limited to:

1. Providing for proper comfort and care of the patient prior to, during and after a procedure, including but not limited to monitoring of intravenous lines (i.e., central lines, Peripherally Inserted Central Catheters [PICC]), oxygen supplies, drains, and patients who are under sedation; and operation of blood pressure cuffs, electrocardiogram (ECG) machines, pulse oximeters, intravenous pumps, and oxygen delivery regulators.
2. Insertion of peripheral intravenous catheters required for performance of a nuclear medicine procedure.
3. Establishing and maintaining proper communication with patients (e.g., proper introduction, appropriate explanation of the procedure, etc.).
4. Behaving in a professional manner in consideration of patients' rights, and resulting in the provision of the highest quality patient care possible.
5. Providing a safe and sanitary working environment for patients and the general public, using proper infection control practices in compliance with accepted precaution policies.
6. Recognizing and responding to an emergency situation at a level commensurate with one's training and competency including cardiopulmonary resuscitation (CPR) and the use of automatic external defibrillators (AED).

B. The tasks a nuclear medicine technologist must perform when preparing the patient for an examination include, but are not limited to:

1. Verifying patient identification, pregnancy status, breast-feeding status, and written orders for the procedure.
2. Ensuring that informed consent has been obtained, as prescribed by the institution, whenever necessary.

3. Confirming that the indication for the procedure is appropriate, and consulting with the authorized user and/or referring physician whenever necessary to ensure that the proper procedure is performed.
4. Obtaining a pertinent patient history.
5. Ensuring that any preprocedural preparation has been completed, including but not limited to fasting, hydration, thyroid blocking, voiding, bowel cleansing, and suspension of interfering medications.
6. Explaining the procedure to the patient and/or family and, where appropriate, to the parents and/or legal guardian, including but not limited to patient involvement, length of study, and radiation safety issues.
7. Collecting samples for laboratory procedures and performing pertinent waived In vitro diagnostic testing laboratory analyses, including urine pregnancy testing and fasting blood sugar. Additionally, In vitro diagnostic testing laboratory procedures include, but are not limited to, secretions, saliva, breath, blood, and stool, to measure biodistribution of radiopharmaceuticals.

C. A nuclear medicine technologist performs administrative procedures, including but not limited to:

1. Maintaining an appropriate inventory of medical/surgical supplies, radiopharmaceuticals, storage media, and other items required to perform procedures in a timely manner.
2. Scheduling patient procedures appropriate to the indication and in the proper sequence.
3. Maintaining appropriate records of administered radioactivity, quality control procedures, patient reports, and other required records.
4. Developing and revising when necessary policies and procedures in accordance with applicable regulations.
5. Actively participating in total quality management/continuous quality improvement programs (i.e., age-specific competencies, patient education, and patient restraint and immobilization).

II. Quality Control—Nuclear Instrumentation

A nuclear medicine technologist ensures the proper performance of imaging systems, storage media, and radiation detection and counting devices, including but not limited to scintillation cameras, dose calibrators, survey instruments, scintillation probes and well counters, and data processing and image production devices.

III. Diagnostic Procedures

A. A nuclear medicine technologist performs imaging procedures, including but not limited to:

1. Preparing, evaluating and properly administering the appropriate radiopharmaceuticals and/or pharmaceuticals and contrast (under the direction of an authorized user).
2. Establishing and/or properly maintaining venous access routes of various configurations (in accordance with hospital policies and procedures).
3. Selecting the appropriate imaging or data collection parameters.
4. Administering radiopharmaceuticals/pharmaceuticals through various routes, including but not limited to oral, intravesical, inhalation, intravenous, intramuscular, subcutaneous, and intradermal (under the direction of an authorized user).
5. Positioning the patient for imaging, adapting the protocol to patient limitations, and acquiring diagnostic quality images.
6. Positioning and verifying the proper placement of electrocardiographic leads.
7. Reviewing images to ensure that required information has been acquired, processed properly, and is of the highest quality.
8. Assisting in cardiac stress testing procedures when performed in conjunction with nuclear medicine procedures.
9. Performing data collection, processing, and analysis.
10. Archiving data to and from storage media.

B. A nuclear medicine technologist performs nonimaging in vivo and/or radioassay studies, including but not limited to:

1. Operating laboratory equipment including well counters, probes, and other detection devices to measure the biodistribution of radiopharmaceuticals.
2. Preparing doses and standards.
3. Collecting the appropriate specimen for procedures using standard precautions.
4. Gathering, validating and documenting data.
5. Managing biohazardous, chemical, and radioactive waste in accordance with applicable regulations and specific facility policies.

IV. Radiopharmaceuticals

A. A nuclear medicine technologist procures and maintains radiopharmaceutical products and adjunct supplies.

B. A nuclear medicine technologist properly prepares and administers diagnostic radiopharmaceuticals under the direction of an authorized user in accordance with all federal, state and institutional guidelines.

V. Radionuclide Therapy

A nuclear medicine technologist properly prepares and administers therapeutic radionuclides, radiopharmaceuticals, and pharmaceutical agents by oral and/or intravenous routes when these agents are part of a standard procedure that is required for treatment under the direction of an authorized user in accordance with federal, state, and institutional regulations.

VI. Radiation Safety

A nuclear medicine technologist performs all procedures utilizing ionizing radiation safely and effectively, applying federal, state, and institutional regulations, including but not limited to:

A. Maintaining compliance with all applicable regulations.

B. Performing appropriate radioactive contamination monitoring and decontamination procedures.

C. Disposing of radioactive waste in accordance with federal, state and institutional regulations.

D. Participating in programs designed to instruct other personnel about radiation hazards and principles of radiation safety.

REFERENCES

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